

Appl. No. 10/765,030
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Reply to Office Action of July 5, 2006

Claims:

Please amend the claims as follows:

1. (twice amended) A crop harvesting header configured for attachment to the mobile frame of a harvesting machine, said header comprising:

a crop cutting assembly comprising a series of rotary cutters that are rotatable about individual, upright axes and have knives that cooperatively define a laterally extending generally planar cutting zone along which crop material is severed from the ground by the cutting assembly;

a pair of laterally extending crop conditioning rolls cooperatively defining a nip therebetween that is spaced upwardly and rearwardly from the cutting zone, [; and]

said pair of conditioning rolls including a lower conditioning roll having a lower, forward peripheral portion that moves forwardly and upwardly generally toward the rotary cutters during rotation of the lower conditioning roll; and

a driveable crop conveying element having at least a portion thereof that moves upwardly and rearwardly between the cutting zone and the nip to convey crop cut by the cutting assembly toward the nip when the element is driven,

said conveying element comprising a laterally extending, rotatable conveying roller having an upper forward peripheral portion that moves rearwardly and upwardly generally away from the rotary cutters during rotation of the conveying roller and a lower, forward peripheral portion that moves forwardly and upwardly generally toward the rotary cutters during rotation of the conveying roller,

said upper forward peripheral portion of the conveying roller being disposed in front of the lower forward peripheral portion of the lower conditioning roll, and most of the lower, forward peripheral portion of the conveying roller being disposed below the plane of said cutting zone.

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3. (twice amended) A crop harvesting header as claimed in claim 2,
each of said crop conveying assemblies including a plurality of laterally spaced impeller
[cages] devices rotatable about individual, upright axes,
each of said impeller [cages] devices presenting a front moveable boundary that is spaced
forwardly of the adjacent inwardly spaced impeller [cage] device.
4. (previously amended) A crop harvesting header as claimed in claim 3,
each outboard cutter section including a first cutter and an inwardly spaced second cutter,
said plurality of impeller [cages] devices including a first impeller [cage] device mounted
to the first cutter for rotational movement therewith, a second impeller [cage]
device mounted to the second cutter for rotational movement therewith, and an
intermediate impeller [cage] device suspended from the header framework
between the first and second impeller [cages] devices.
5. (currently amended) A crop harvesting header as claimed in claim 1,
[said crop cutting assembly and said conveying element defining a downwardly open area
therebetween.]
said conveying roller having an outermost diameter that is smaller than the outermost
diameter of the lower conditioning roll.
6. (twice amended) A crop harvesting header as claimed in claim [1] 4,
[said conveying element comprising a laterally extending, rotatable conveying roller
having an outer periphery defining the upwardly and rearwardly moveable portion
of the conveying element]
each of said impeller devices comprising a cage.

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7. (currently amended) A crop harvesting header as claimed in claim [6] 1,
[said conveying roller and said cutting assembly presenting a downwardly open area
therebetween.]

said conveying roller comprising a single roller, unaccompanied by an upper roller
forming a nip therewith.

8. (currently amended) A crop harvesting header as claimed in claim [6] 1,
[said conveying roller including at least one helical rib extending along the roller
periphery and having opposite inclination on either side of the midpoint of the
conveying roller.]

said series of cutters including multiple pairs of oppositely rotating cutters.

9. (twice amended) [A crop harvesting header as claimed in claim 6,]
A crop harvesting header configured for attachment to the mobile frame of a harvesting
machine, said header comprising:

a crop cutting assembly comprising a series of rotary cutters that are rotatable about
individual, upright axes and that cooperatively define a laterally extending cutting
zone along which crop material is severed from the ground by the cutting
assembly;

a pair of laterally extending crop conditioning rolls cooperatively defining a nip
therebetween that is spaced upwardly and rearwardly from the cutting zone; and
a driveable crop conveying element having at least a portion thereof that moves upwardly
and rearwardly between the cutting zone and the nip to convey crop cut by the
cutting assembly toward the nip when the element is driven.

said conveying element comprising a laterally extending, rotatable conveying roller
having an outer periphery defining the upwardly and rearwardly moveable portion
of the conveying element.

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said conveying roller having [a relatively smaller diameter than the conditioning rolls.] an outermost diameter that is smaller than the outermost diameter of the lower conditioning roll.

10. (currently amended) A crop harvesting header as claimed in claim 9, [said conditioning rolls being in a stacked relationship to present an upper conditioning roll and a lower conditioning roll, said lower conditioning roll being rotatable about a lower conditioning roll axis,] said conveying roller being rotatable about a conveying roller axis that is [lower than the lower conditioning roll axis] generally vertically aligned with the plane of said cutting zone.

11. (currently amended) A crop harvesting header as claimed in claim [10] 1, said [cutting zone being substantially planar and generally vertically aligned with the conveying roller axis] conveying roller being rotatable about a conveying roller axis that is generally vertically aligned with the plane of said cutting zone.

12. (twice amended) In a crop harvesting machine having a mobile frame, the improvement comprising:

a crop cutting assembly comprising a series of rotary cutters that are rotatable about individual, upright axes and have knives that cooperatively define a laterally extending generally planar cutting zone along which crop material is severed from the ground by the cutting assembly;

a pair of laterally extending crop conditioning rolls cooperatively defining a nip therebetween that is spaced upwardly and rearwardly from the cutting zone, [; and]

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said pair of conditioning rolls including a lower conditioning roll having a lower, forward peripheral portion that moves forwardly and upwardly generally toward the rotary cutters during rotation of the lower conditioning roll; and
a driveable crop conveying element having at least a portion thereof that moves upwardly and rearwardly between the cutting [Zone] zone and the nip to convey crop cut by the cutting assembly toward the nip when the element is driven,
said conveying element comprising a laterally extending, rotatable conveying roller having an upper forward peripheral portion that moves rearwardly and upwardly generally away from the rotary cutters during rotation of the conveying roller and a lower, forward peripheral portion that moves forwardly and upwardly generally toward the rotary cutters during rotation of the conveying roller,
said upper forward peripheral portion of the conveying roller being disposed in front of the lower forward peripheral portion of the lower conditioning roll, and most of the lower, forward peripheral portion of the conveying roller being disposed below the plane of said cutting zone.

14. (twice amended) In a crop harvesting machine as claimed in claim 13, each of said crop conveying assemblies including a plurality of laterally spaced impeller [cages] devices rotatable about individual, upright axes, each of said impeller [cages] devices presenting a front moveable boundary that is spaced forwardly of the adjacent inwardly spaced impeller [cage] device.

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15. (previously amended) In a crop harvesting machine as claimed in claim 14, each outboard cutter section including a first cutter and an inwardly spaced second cutter, said plurality of [impeller cages] impeller devices including a first impeller [cage] device mounted to the first cutter for rotational movement therewith, a second impeller [cage] device mounted to the second cutter for rotational movement therewith, and an intermediate impeller [cage] device suspended from the framework between the first and second impeller [cages] devices.

16. (currently amended) In a crop harvesting machine as claimed in claim 12, [said crop cutting assembly and said conveying element defining a downwardly open area therebetween.]

said conveying roller having an outermost diameter that is smaller than the outermost diameter of the lower conditioning roll.

17. (twice amended) In a crop harvesting machine as claimed in claim [12] 14, [said conveying element comprising a laterally extending, rotatable conveying roller having an outer periphery defining the upwardly and rearwardly moveable portion of the conveying element.]
each of said impeller devices comprising a cage.

18. (currently amended) In a harvesting machine as claimed in claim [17] 12, [said conveying roller and said cutting assembly presenting a downwardly open area therebetween.]

said conveying roller comprising a single roller, unaccompanied by an upper roller forming a nip therewith.

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19. (currently amended) In a harvesting machine as claimed in claim [17] 12,
[said conveying roller including at least one helical rib extending along the roller
periphery and having opposite inclination on either side of the midpoint of the
conveying roller.]

said series of cutters including multiple pairs of oppositely rotating cutters.

20. (twice amended) [In a crop harvesting machine as claimed in claim 17,]
In a crop harvesting machine having a mobile frame, the improvement comprising:
a crop cutting assembly comprising a series of rotary cutters that are rotatable about
individual, upright axes and that cooperatively define a laterally extending cutting
zone along which crop material is severed from the ground by the cutting
assembly;
a pair of laterally extending crop conditioning rolls cooperatively defining a nip
therebetween that is spaced upwardly and rearwardly from the cutting zone; and
a driveable crop conveying element having at least a portion thereof that moves upwardly
and rearwardly between the cutting zone and the nip to convey crop cut by the
cutting assembly toward the nip when the element is driven,
said conveying element comprising a laterally extending, rotatable conveying roller
having an outer periphery defining the upwardly and rearwardly moveable portion
of the conveying element,
said conveying roller having [a relatively smaller diameter than the conditioning rolls] an
outermost diameter that is smaller than the outermost diameter of the lower
conditioning roll.

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21. (currently amended) In a harvesting machine as claimed in claim 20,
[said conditioning rolls being in a stacked relationship to present an upper conditioning
roll and a lower conditioning roll,
said lower conditioning roll being rotatable about a lower conditioning roll axis,]
said conveying roller being rotatable about a conveying roller axis that is [lower than the
lower conditioning roll axis] generally vertically aligned with the plane of said
cutting zone.
22. (currently amended) In a harvesting machine as claimed in claim [21] 20,
said [cutting zone being substantially planar and generally vertically aligned with the
conveying roller axis] series of cutters including multiple pairs of oppositely
rotating cutters.
23. (twice amended) A crop harvesting machine comprising:
a mobile frame; and
a harvesting header supported on the frame for harvesting crop as the frame moves across
a field, said header including
a cutter bed extending across the path of travel of the frame and including a series
of rotary cutters that are rotatable about individual, upright axes and that
have knives that cooperatively define a laterally extending generally planar
cutting zone along which crop material is severed from the ground by the
cutter bed.
header framework defining a laterally extending discharge opening spaced
rearwardly from the cutter bed, with the opening being configured to
receive cut crop from the series of cutters,

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a pair of crop conditioning rolls spanning the discharge opening and defining a nip therebetween that is spaced upwardly and rearwardly from the cutter bed, [and]

said pair of conditioning rolls including a lower conditioning roll having a lower, forward peripheral portion that moves forwardly and upwardly generally toward the rotary cutters during rotation of the lower conditioning roll, and a laterally extending crop conveying roller located between the cutter bed and the nip,

 said conveying roller being rotatable in a direction to move crop from the cutter bed toward the nip,

said conveying roller having an upper forward peripheral portion that moves rearwardly and upwardly generally away from the rotary cutters during rotation of the conveying roller and a lower, forward peripheral portion that moves forwardly and upwardly generally toward the rotary cutters during rotation of the conveying roller,

said upper forward peripheral portion of the conveying roller being disposed in front of the lower forward peripheral portion of the lower conditioning roll, and most of the lower, forward peripheral portion of the conveying roller being disposed below the plane of said cutting zone.

26. (currently amended) A crop harvesting machine as claimed in claim 25, each of said crop conveying assemblies including a plurality of laterally spaced impeller [cages] devices rotatable about individual, upright axes, each of said impeller [cages] devices presenting a front moveable boundary that is spaced forwardly of the adjacent inwardly spaced impeller [cage] device.

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27. (previously amended) A crop harvesting machine as claimed in claim 26, each set of outboard cutters including a first cutter and an inwardly spaced second cutter, said plurality of impeller [cages] devices including a first impeller [cage] device mounted to the first cutter for rotational movement therewith, a second impeller [cage] device mounted to the second cutter for rotational movement therewith, and an intermediate impeller [cage] device suspended from the framework between the first and second impeller [cages] devices.
28. (currently amended) A crop harvesting machine as claimed in claim [23] 27, [said cutter bed and said conveying roller defining a downwardly open area therebetween.]
each of said impeller devices comprising a cage.
29. (currently amended) A crop harvesting machine as claimed in claim [23] 25, [said conveying roller including at least one helical rib extending along the roller periphery and having opposite inclination on either side of the midpoint of the conveying roller.]
said series of rotary cutters including multiple pairs of oppositely rotating cutters disposed in forward alignment with said discharge opening.
30. (currently amended) A crop harvesting machine as claimed in claim 23, said conveying roller having [a relatively smaller diameter than the conditioning rolls.] an outermost diameter that is smaller than the outermost diameter of the lower conditioning roll.

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31. (currently amended) A crop harvesting machine as claimed in claim 30,
[said conditioning rolls being in a stacked relationship to present an upper conditioning
roll and a lower conditioning roll,
said lower conditioning roll being rotatable about a lower conditioning roll axis,]
said conveying roller being rotatable about a conveying roller axis that is [lower than the
lower conditioning roll axis.] generally vertically aligned with the plane of said
cutting zone.
32. (currently amended) A crop harvesting machine as claimed in claim [31] 23,
[said cutter bed defining a substantially planar cutting zone,]
said conveying roller having a conveying roller axis [being] that is generally vertically
aligned with the plane of the cutting zone.

Cancel claims 33-39

40. (previously added and currently amended) A crop harvesting machine comprising:
a mobile frame; and
a harvesting header supported on the frame for harvesting crop as the frame moves across
a field, said header including
a cutter bed extending across the path of travel of the frame and including a series
of rotary cutters rotatable about individual, upright axes,
said cutters having knives that cooperatively define a laterally extending generally
planar cutting zone along which crop material is severed from the ground
by the cutter bed,
header framework defining a laterally extending discharge opening spaced
rearwardly from the cutter bed, with the opening being configured to
receive cut crop from the series of cutters,

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a pair of transversely extending, oppositely rotating crop conditioning rolls disposed within and spanning the discharge opening and defining a nip therebetween that is spaced upwardly and rearwardly from the cutter bed, said pair of conditioning rolls including a lower conditioning roll having a lower, forward peripheral portion that moves forwardly and upwardly generally toward the rotary cutters during rotation of the lower conditioning roll.

said discharge opening having a pair of opposite ends,

said series of cutters including multiple pairs of oppositely rotating cutters positioned to direct severed material into the discharge opening,

said cutter bed projecting laterally outwardly beyond opposite ends of the discharge opening to present two sets of outboard cutters at opposite ends of the cutter bed that are disposed outboard of the discharge opening with the outboard cutters of each set rotating in the same direction generally inwardly toward the discharge opening,

a pair of crop conveying assemblies at opposite ends of the cutter bed for assisting in directing crop severed by the outboard cutters laterally inwardly generally toward the discharge opening,

each of said crop conveying assemblies comprising a plurality of laterally spaced impeller devices disposed higher than the outboard cutters and rotatable inwardly about individual, upright axes,

a laterally extending crop conveying roller located between the cutter bed and the nip,

said conveying roller being rotatable in a direction to move crop from the cutter bed toward the nip,

said conveying roller being disposed within said discharge opening and spanning the same,

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said conveying roller having an upper forward peripheral portion that moves rearwardly and upwardly generally away from the rotary cutters during rotation of the conveying roller and a lower, forward peripheral portion that moves forwardly and upwardly generally toward the rotary cutters during rotation of the conveying roller,

said upper forward peripheral portion of the conveying roller being disposed in front of the lower forward peripheral portion of the lower conditioning roll, and most of the lower, forward peripheral portion of the conveying roller being disposed below the plane of said cutting zone.

41. (previously added and currently amended) A crop harvesting machine as claimed in claim 40,

said conveying roller having an outermost diameter that is smaller than the outermost diameter of the lower conditioning roll.

Cancel claim 42.

43. (previously added and currently amended) A crop harvesting machine as claimed in claim 40,

said conveying roller being rotatable about a conveying roller axis that is generally vertically aligned with the plane of said cutting zone.

Cancel claims 44 and 45.

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46. (previously added and currently amended) A crop harvesting machine as claimed in claim 40,

each plurality of impeller devices including an outer impeller device having a front inwardly movable boundary and an inner impeller device having a front inwardly movable boundary,
the inwardly movable boundary of each outer impeller device being spaced forwardly of the inwardly movable boundary of the corresponding inner impeller device.

47. (previously added) A crop harvesting machine as claimed in claim 46,
each plurality of impeller devices further including an intermediate impeller device disposed generally between said outer impeller device and said inner impeller device,

each intermediate impeller device having a front inwardly movable boundary,
the inwardly movable boundary of each outer impeller device being spaced forwardly of the inwardly movable boundary of the corresponding intermediate impeller device.

48. (previously added) A crop harvesting machine as claimed in claim 46,
each set of outboard cutters including an outer cutter and an inner cutter,
said plurality of impeller devices including an outer impeller device rotatable about the same axis of rotation as the corresponding outer cutter and an inner impeller device rotatable about the same axis of rotation as the corresponding inner cutter.

49. (previously added and currently amended) A crop harvesting machine as claimed in claim 46,
at least some of said impeller devices being generally cylindrical and comprising cages having a plurality of circumferentially spaced uprights.